

REMARKS

These Amendments and Remarks are filed in response to the Office Action dated February 8, 2007. For the following reasons this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Support for new Claim 11 is found in steps S2 and S4 of FIG. 2 and the corresponding written description (page 9, line 26 to page 10, line 4). New claim 12 is supported by steps S2 and S4 of FIG. 2 and the accompanying written description (page 8, line 18 to page 9, line 15; page 9, line 26 to page 10, line 4; and page 13, lines 23-25). The specification at page 11, lines 5-20 and page 12, lines 8-17 and steps S14 and S17 of Fig. 3 provide support for new claim 13. New claim 14 is supported by steps S34 and S36 of FIG. 4 and the corresponding written description at page 16, lines 23-25 and page 17, lines 12-16. Support for new claim 15 is found in the written description at page 4, lines 15-17. The amendments to Figs. 3 and 7 is supported by the written description at page 12, lines 17-20.

Claims 1-15 are pending in this application. Claims 1-10 are rejected. New claims 11-15 have been added in this response.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-3, 6, and 8-10 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kanai et al. (US 2001/0021468). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed and the cited prior art.

An aspect of the invention, per claim 1, is a fuel cell system having a fuel cell generating power as a result of chemical reactions between supplied gases, wherein a coolant flows in the fuel cell and undergoes a temperature increase as a result of absorbing waste heat produced by power generation in the fuel cell, a water tank, a humidifying device for humidifying at least one

Amendments to the Drawings:

Step S18 is corrected in Figs. 3 and 7. The correction is shown in attached Replacement Sheets of Figs. 3 and 7.

supplied gas by using water from the water tank, and a coolant temperature regulation device for regulating a temperature of the coolant flowing inside the fuel cell so as to control the temperature of the fuel cell. The fuel cell system comprises a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank and a coolant recirculation passage for allowing a recirculation of the coolant through the defrosting device and the fuel cell. A flow generator generates a flow of the coolant from the fuel cell to the defrosting device and a controller controls a startup operation of the fuel cell system. The controller has the function of controlling the flow generator to generate a flow of coolant from the fuel cell to the defrosting device so as to melt ice in the water tank while the startup operation of the fuel cell system.

Another aspect of the invention, per claim 9, is a fuel cell system having a fuel cell generating power as a result of chemical reactions between supplied gases, wherein a coolant flows in the fuel cell and undergoes a temperature increase as a result of absorbing waste heat produced by power generation in the fuel cell, a water tank, a humidifying device for humidifying at least one supplied gas by using water from the water tank, and a coolant temperature regulation device for regulating a temperature of the coolant flowing inside the fuel cell so as to control the temperature of the fuel cell. The fuel cell system comprises a defrosting means for melting ice in the water tank by applying heat of the coolant to the water tank and a coolant recirculation passage means for allowing a recirculation of the coolant through the defrosting means and the fuel cell. A flow generating means generates a flow of the coolant from the fuel cell to the defrosting means and a control means controls the flow generator to generate a flow of coolant from the fuel cell to the defrosting means so as to melt ice in the water tank while a startup operation of the fuel cell system.

Another aspect of the invention, per claim 10, is a control method for controlling a fuel cell system. The fuel cell system has a fuel cell generating power as a result of chemical reactions between supplied gases, wherein a coolant flows in the fuel cell and undergoes a temperature increase as a result of absorbing waste heat produced by power generation in the fuel cell, a water tank, a humidifying device for humidifying at least one supplied gas by using water from the water tank, and a coolant temperature regulation device for regulating a temperature of the coolant flowing inside the fuel cell so as to control the temperature of the fuel cell. The control method comprises the steps of providing a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank. A coolant recirculation passage is provided to allow a recirculation of the coolant through the defrosting device and the fuel cell. A flow of coolant is generated from the fuel cell to the defrosting device so as to melt ice in the water tank while a startup operation of the fuel cell system.

The Examiner asserted that Kanai et al. disclose a fuel cell system comprising a fuel cell, a water-permeable-type humidifier, an auxiliary humidifier, radiator, condenser, water storage tank, and an injector.

Kanai et al., however, do not anticipate the claimed fuel cell systems and method for controlling a fuel cell system because Kanai et al. do not disclose a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 1; a defrosting means for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 9; and providing a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 10.

Kanai et al. shows an electric heater as an anti-freezing apparatus. This prior art technique is the same as that shown in BACKGROUND OF THE INVENTION of the present

application. This prior art technique prevents freezing of water by using an electrical heater to heat the water tank. The prior art technique, however, is not desirable because it increases the load on the battery due to an extremely large amount of power used by the electrical heater in order to prevent freezing of water.

On the other hand, the present invention prevents the consumption of the extremely large amount of power by using a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank. Kanai et al. do not disclose such a defrosting device.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Kanai et al. do not disclose a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 1; a defrosting means for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 9; and providing a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 10, Kanai et al. do not anticipate claims 1, 9, and 10.

Applicant further submits that Kanai et al. do not suggest the claimed fuel cell systems and method.

Claim Rejections Under 35 U.S.C. § 103

Claims 4, 5, and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kanai et al. in view of Ballantine et al. (U.S. 2001/002468). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Examiner acknowledged that Kanai et al. do not disclose bypassing the radiator. The Examiner relied on Ballantine et al. to assert that it would have been obvious to incorporate a radiator bypass in the system of Kanai et al. to allow the heat generated by the fuel cell system to be controlled more efficiently.

The combination of Kanai et al. and Ballantine et al., however, do not suggest the claimed fuel cell system. Ballantine et al. do not cure the deficiencies of Kanai et al. Ballantine et al. disclose a radiator for removing heat from the coolant of the fuel cell. Ballantine et al. do not disclose a defrosting device for melting ice in the water tank by applying heat of the coolant to the water tank, as required by claim 1.

The dependent claims are allowable for at least the same reasons as claim 1 and further distinguish the claimed semiconductor device.

In view of the above amendments and remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

Application No.: 10/529,040

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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